

Remarks

The Applicants have amended the Specification to correct minor grammatical errors. Entry into the official file is respectfully requested.

Claim 1 has been amended as to form so that it is in better idiomatic English. The subject matter of Claim 3 has also been added. Claim 3 has accordingly been cancelled. Entry into the official file is respectfully requested.

The Applicants have added new Claim 11. It is based primarily on originally filed Claim 1 with the following differences. Claim 11 is now recited as a coated base fabric consisting of a resin coating elastomer applied to a base fabric. Claim 11 excludes other major components such as additional layers, etc. Entry into the official file and examination on the merits is respectfully requested.

The Applicants confirm the withdrawal of Claims 6-10 based on the Applicants' earlier election of Group I including Claims 1-5. Claims 6-10 have been cancelled without prejudice and without disclaimer of the subject matter therein. The Applicants specifically reserve the right to file one or more divisional applications directed to that subject matter.

Prior to addressing the specifics of the rejection, the Applicants have several introductory comments concerning the claimed subject matter.

It is advantageous in the claimed subject matter that (1) the filaments of warp yarn and weft yarn, respectively, are aligned in the base fabric such that the total average horizontal index (HI) falls within a range of from 0.75 to 1.0, and (2) the amount of the resin elastomer adhered to the fabric is from 5 to 30 g/m².

The Applicants can obtain a well-balanced coated air bag having good compactness, containability, flame resistance, and no air permeability for a selected time for the first time. The

prior air bags were compact and exhibited containability, but did not have flame resistance, namely heat-resistance for more generation of heat because of improvements in the inflater (apparatus for gas generation) nor zero permeability. The claimed subject matter can simultaneously attain these characteristics for the first time.

The Applicants acknowledge the rejection of Claims 1-5 under 35 U.S.C. §103 over the hypothetical combination of Veiga with JP'740. The Applicants respectfully submit that Claims 1-5 are patentable over both publications, whether taken individually or collectively, for the reasons set forth below.

The Applicants note with appreciation the Examiner's detailed comments concerning the hypothetical applicability of JP'740 to those claims. JP '740 discloses that using flattened cross-section yarns can enhance HI. However, JP '740 does not teach or suggest the concrete relation between HI and the details of flattened cross-section yarn. The Applicants found that controlling entanglements of material yarns and entanglements of yarns in the fabric can enhance HI. JP '740 discloses high entanglement of yarns at paragraph [0036], but high entanglement does not attain high HI of both warp yarns and weft yarns. For example, Comparative Examples 3 and 4 and the invention Examples show that high entanglements 35 can attain low HI of both warp yarn and weft yarn, namely 0.66, 0.67, 0.78, and 0.72. Comparing Example 1 with Comparative Examples 3 and 4, there is a big difference in the degree of stiffness. When HI is too low, such as in Comparative Examples 3 and 4, the degree of stiffness becomes large and, therefore, it is inevitable that the thickness of the resulting airbags is large.

Moreover, the Applicants found that high HI can make the base fabric thin and flexible, make the surface of the base fabric flattened and make a thin and uniform resin elastomer coating. As a

result, a coated base fabric for airbags that has good and well-balanced properties necessary for base fabrics for airbags is achieved.

JP '740 discloses coating in paragraph [0044], but actually recommends or teaches no coating. Moreover, JP '740 does not teach the particulars of coating. In the Applicants' claims, the amount of the resin elastomer is important. Comparing Examples 1 and 9 with Comparative Examples 7 and 8 reveals a critical dividing line. When the adhered resin amount is less than 5 g/m^2 , permeability of the base fabric is not zero (Comparative Example 7). On the other hand, when the adhered resin amount is more than 30 g/m^2 , the degree of stiffness is large and the thickness of the airbag becomes large in spite of the almost same thickness of the fabric. That is, it becomes difficult to fold and attain the desired compactness.

As mentioned above, the high HI of both warp yarn and weft yarn can make the base fabric thin and flexible, make the surface of the base fabric flattened and make a thin and uniform coating with a resin elastomer. As a result, a coated base fabric for airbags that has good and well-balanced properties necessary for base fabrics for airbags can be achieved.

In the Applicants' Example 1, permeability of the coated airbag, with 15 g/m^2 of adhered resin and a circular cross section, is zero. However, both the degree of stiffness and thickness of the airbag is large. Even one skill in the art cannot imagine zero permeability at high pressure, flexibility and compatibility or compactness such as thin thickness of an airbag. The invention proves the defects of JP '740 while maintaining the virtues of JP '740 such as flexibility because of no coating. Moreover, the claimed fabric obtains a stronger tear strength. This is understood by comparing Examples 1 and 9 (Example 9 becomes Comparative Example for this limited purpose because the adhered resin amount is 1). That is, Example 1 is superior in tear strength to Example 9. JP '740 does not teach or suggest that new effect.

The rejection also relies at least in part on the belief that JP'740 discloses that the major axis of the single yarn should be placed parallel to the flat surface of the fabric to decrease the gaps in the woven fabric, thereby suppressing air permeability or to produce a set air permeability from a lighter fabric when compared to a fabric made from round fiber. The rejection then states that it would be obvious for one skilled in the art to optimize the HI of the fabric to increase the air permeability of the fabric made from flattened fibers or to decrease the overall weight, as well as the thickness of the fabric to the greatest extent. Paragraph [0018] of JP'740 is the text particularly relied upon. That text is produced below for the Examiner's convenience.

The greatest characteristics of this invention is that the single yarn cross section of filament which comprises grain cloth for airbags is a cross-sectional thing that is not a usual circle cross-section and that has specific compression degree. If modified cross section fiber (only henceforth compressed thread) which has aspect ratio more than fixed, when it is considered as woven fabric, major axis of single yarn cross section is placed in parallel with this flat surface on textile flat surface. As a result, gap per unit surface area decreases in number to the thickness direction of woven fabric, using circle cross section of equivalent size, when weave density is equivalent, it compares, air permeability is suppressed. Moreover, if it is going to design to equivalent air permeability, it will be possible to decrease total size made, and it can be considered as lightweight grain cloth with thin thickness.

The Applicants agree that JP'740 discloses that using the modified cross-section fibers, relative to the usual circular cross-section fibers, the major axis of the single yarn cross-section is placed in parallel with the flat surface of the cloth. The result is that the gap per unit surface area decreases and suppresses air permeability. This theoretically allows for the overall thickness of the cloth, but not the airbag, to be decreased and maintain an equivalent air permeability of prior fabrics.

Referring again, however, to the Applicants' Specification and the total average horizontal index (HI) of the base fabric, the Applicants have discovered that the HI falling within the claimed

range of from 0.75 to 1.0, of course, makes the base fabric thin. However, it is not the claimed HI range and is not for the purpose of suppressing or decreasing air permeability as taught by JP'740. The reason that the Applicants want to have the HI in the range of from 0.75 to 1.0 is to improve the flexibility and containability of the base fabric as an airbag. JP '740 does not appreciate this.

The Applicants have also discovered as noted above that by having the flattened cross-section yarns within the specified HI range, the elastomer coating can be more thinly and uniformly applied to the fabric. Application of the elastomer coating is important with respect to the air permeability in this instance rather than the flattened cross-section of the yarn. The Applicants therefore respectfully submit that it would not be obvious to one of ordinary skill in the art to optimize the HI of the fabric for the purpose of improving the flexibility, containability and the coatability of the fabric based on the teachings of JP'740 which looks to the flatness of the cross-section yarns to change air permeability. The Applicants therefore respectfully submit that JP'740 is inapplicable.

The Applicants respectfully submit that this is reinforced by the Applicants by reference to several of the examples wherein Comparative Examples 2-6 relied on flat fibers. Under the theory of the rejection with respect to the teachings of JP'740, one skilled in the art would seek to use flat cross-section fibers because they would suppress air permeability to virtually zero. However, the Applicants discovered that utilizing flat fibers does not work for the reasons shown in Applicants' Table 1 on Page 40 of the Specification. Thus, this is further evidence of the inapplicability of JP'740.

The rejection relies on Veiga to provide teachings concerning application of a specified amount of resin to the fabric to cure the admitted deficiency or the admitted lack of teaching with respect to a resin coating in JP'740. However, even if one of ordinary skill in the art were to hypothetically make the combination for that purpose, the provision of the resin from Veiga would

still fail to cure the deficiencies set forth above with respect to JP'740. Thus, the hypothetical combination would still fail.

Moreover, Veiga discloses application of a prime coat layer applied to the fabric, followed by a solid polymeric film applied to the prime coat layer. The Applicants do not need to do this. In any event, one of ordinary skill in the art would not look to Veiga based on the teachings of JP'740 because one skilled in the art would believe that it would take two layers to achieve a suitable coating because application of the Veiga two layer coating system would be directly contrary to the Applicants' desire to have improved flexibility and containability. Inasmuch as Veiga teaches a system that would be believed by one of ordinary skill in the art to teach directly opposite of a prime objective of the Applicants' invention, one skilled in the art would not look to Veiga and would not make the hypothetical combination. As a consequence, the Applicants respectfully submit that one skilled in the art would not make the hypothetical combination and the Applicants respectfully request withdrawal of the rejection.

In light of the foregoing, the Applicants respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,



T. Daniel Christenbury
Reg. No. 31,750
Attorney for Applicants

TDC:nn
(215) 656-3381